

# MAPS Tracker Variations

DISCLAIMER: I show on the following slides various of MAPS tracking configurations where I have evaluated the performance with some layers removed.

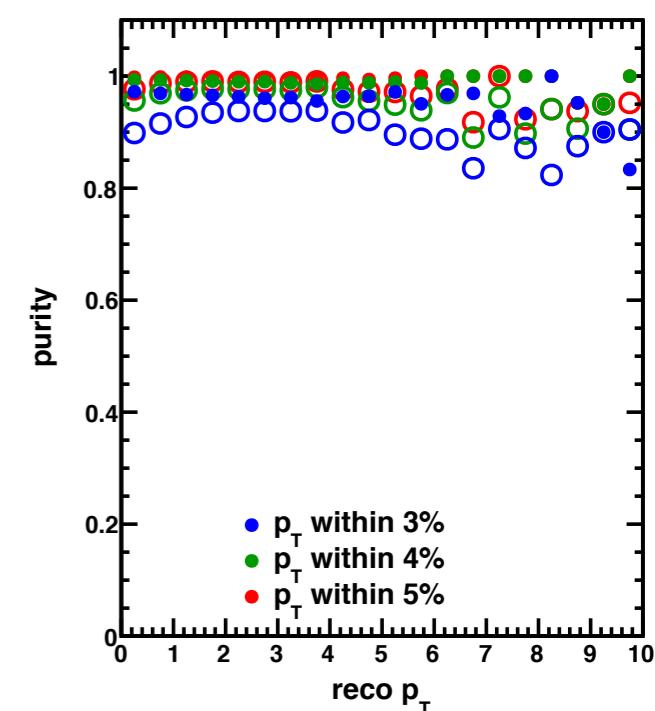
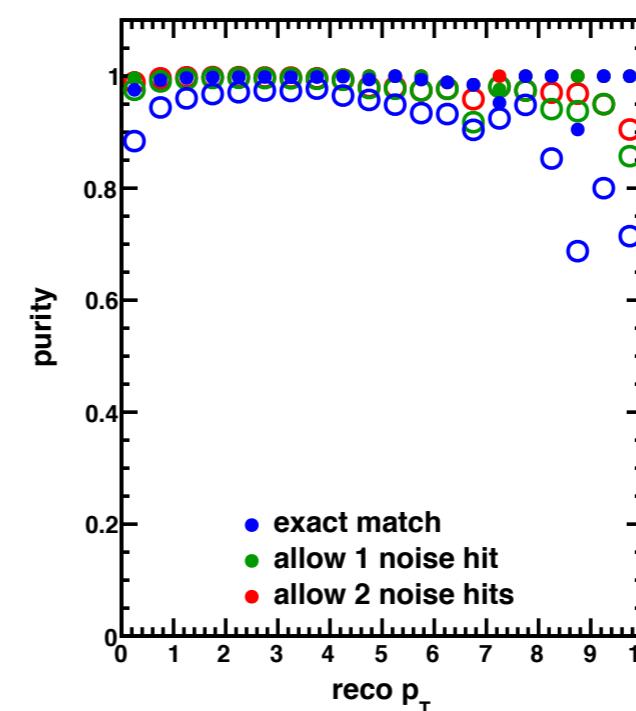
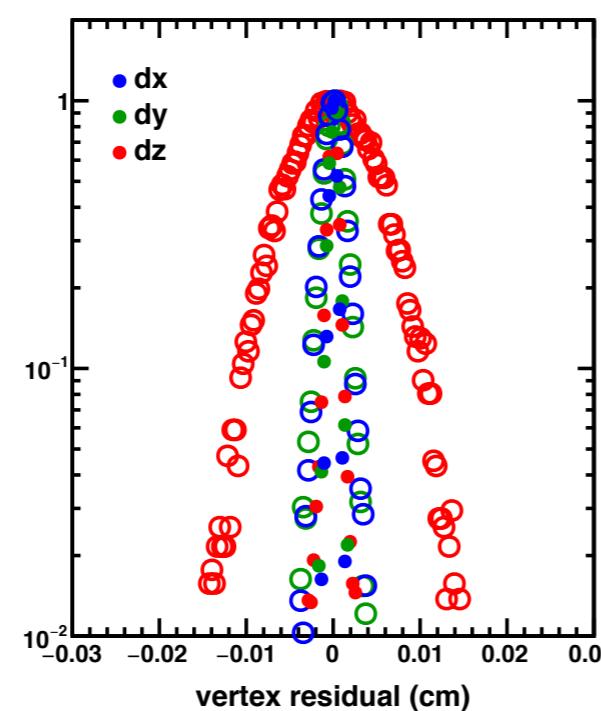
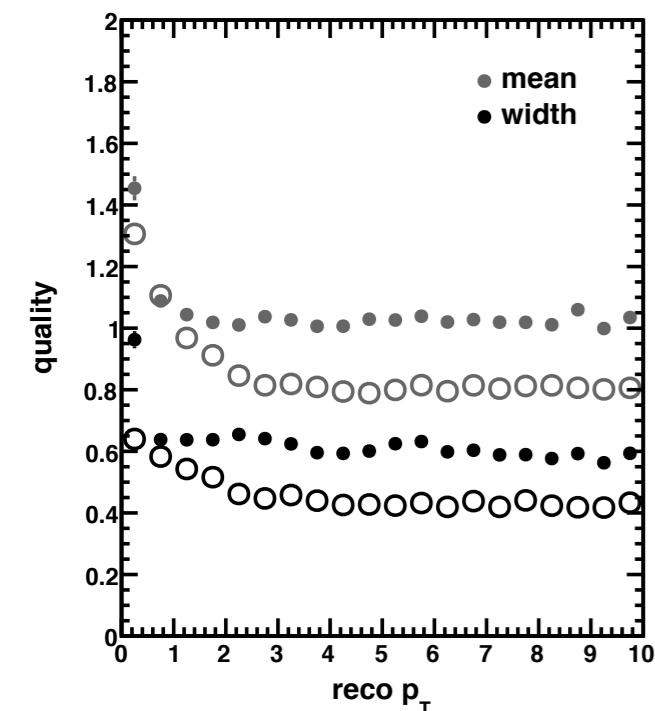
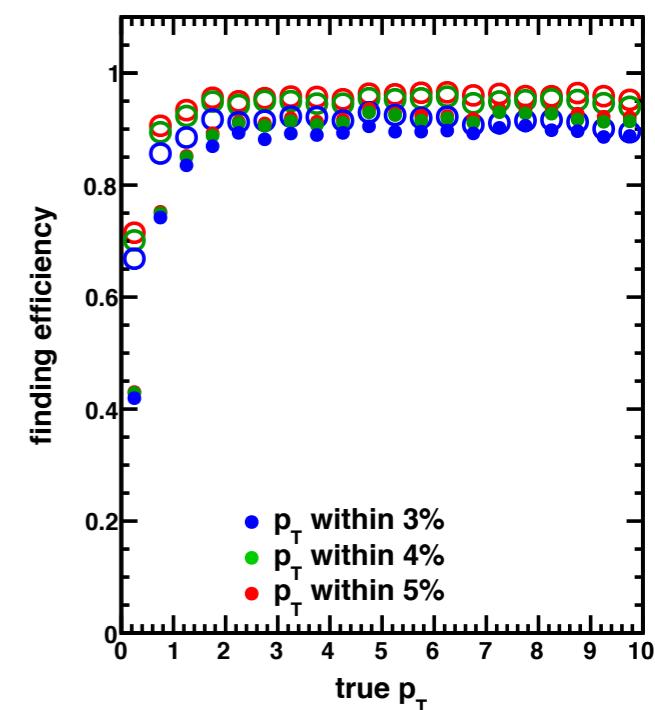
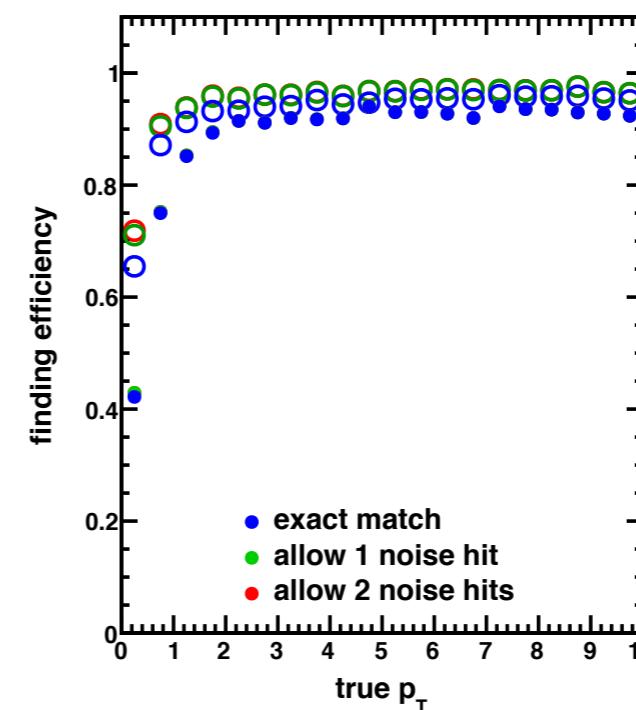
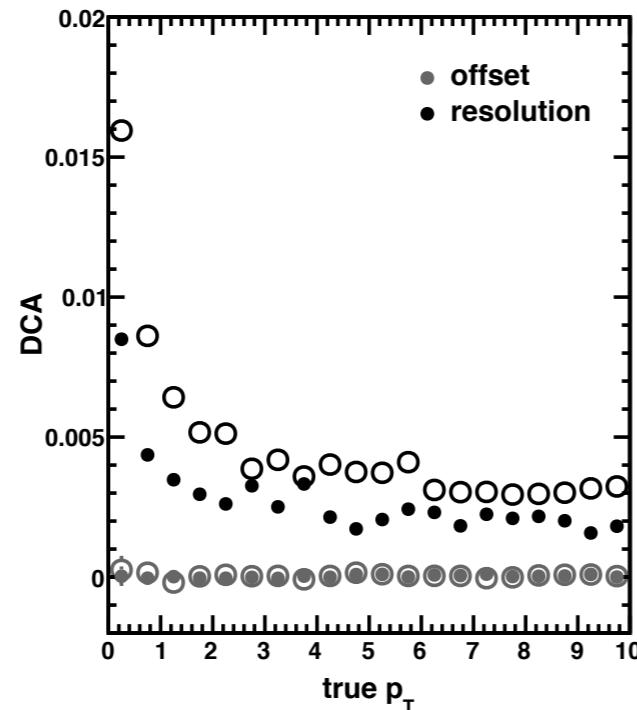
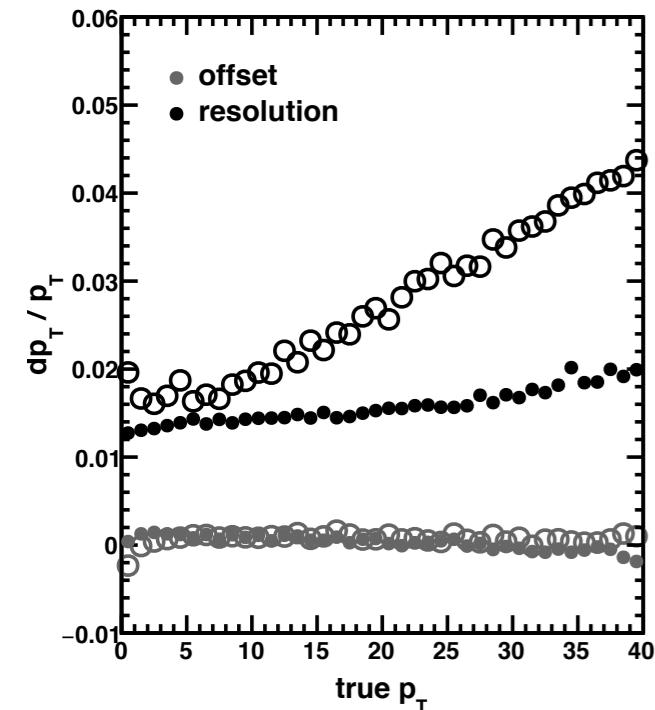
The summary here contains plots that were run over the last 2 months at various points in the code development and so will have some minor differences that are unimportant and have been noted on the plot. As we get farther from the 3+2+2 configuration the chisq distributions change but the cut is the same and some efficiency is lost. That situation can be recovered with a bit of software retuning which I haven't done in these single iteration tests.

Also I won't have removed the layers **you** would have removed in doing these tests—many of these options were run to answer different questions and I just happen to have the output on hand to show you in this summary.

There are some small uniformity issues in the macros too (lot's of cut and paste at various stages has differences in ladder lengths & 20-30 um pixel sizes). I'll have to fix that at my next opportunity.

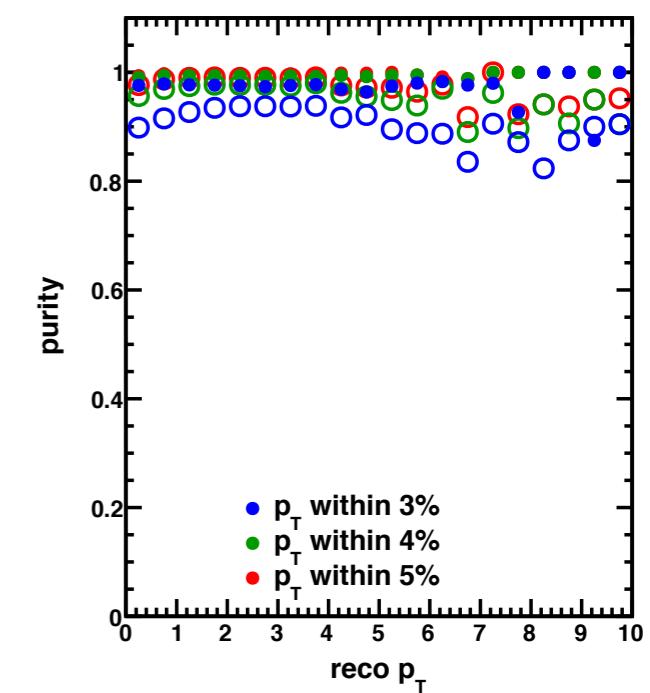
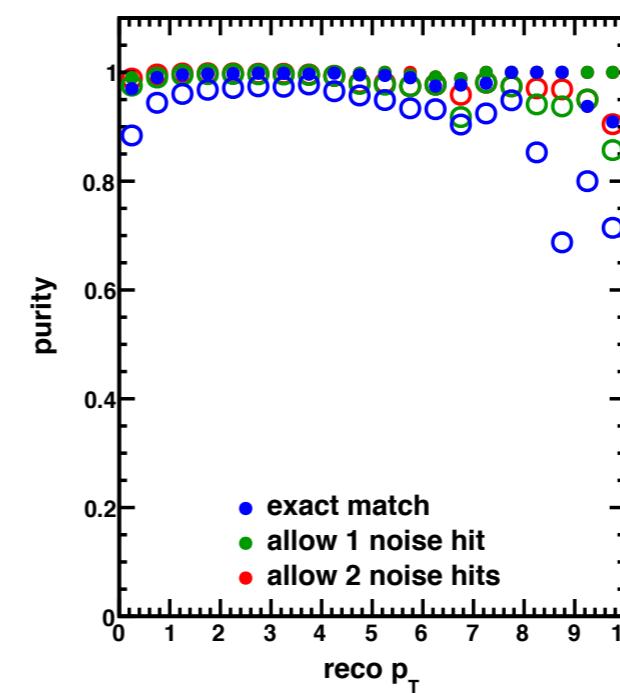
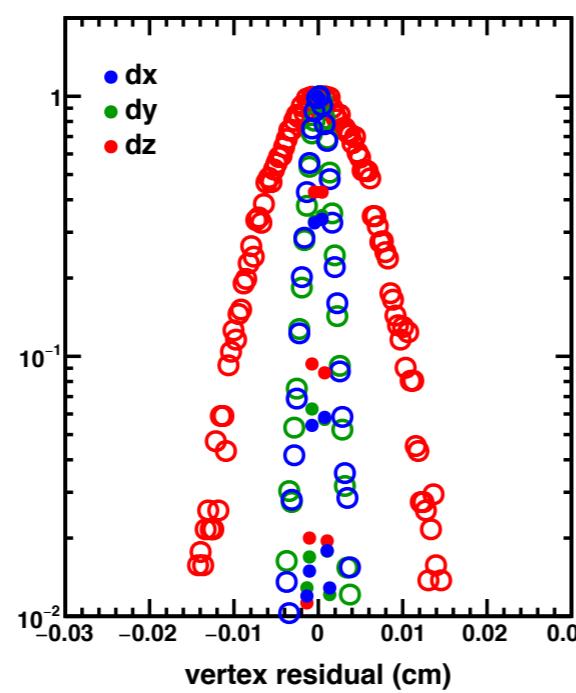
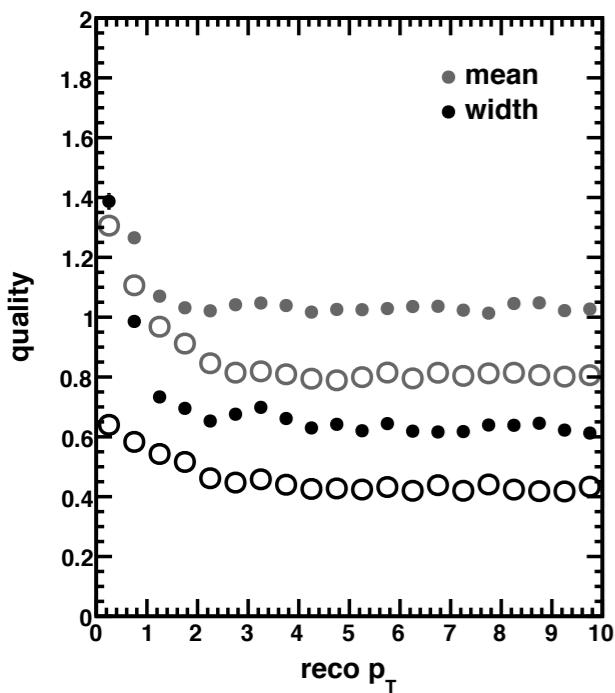
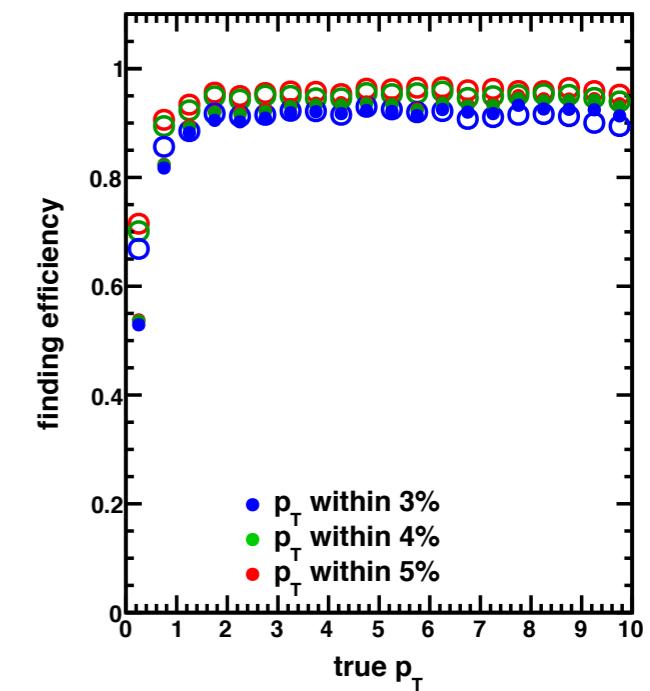
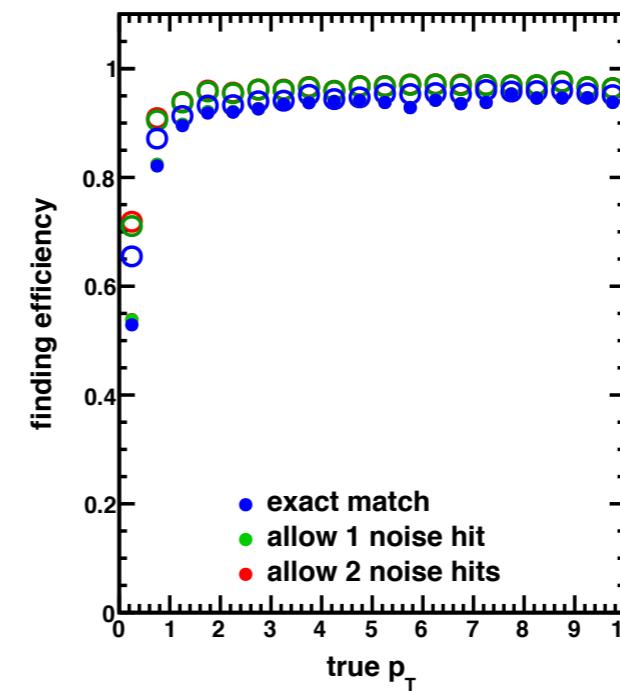
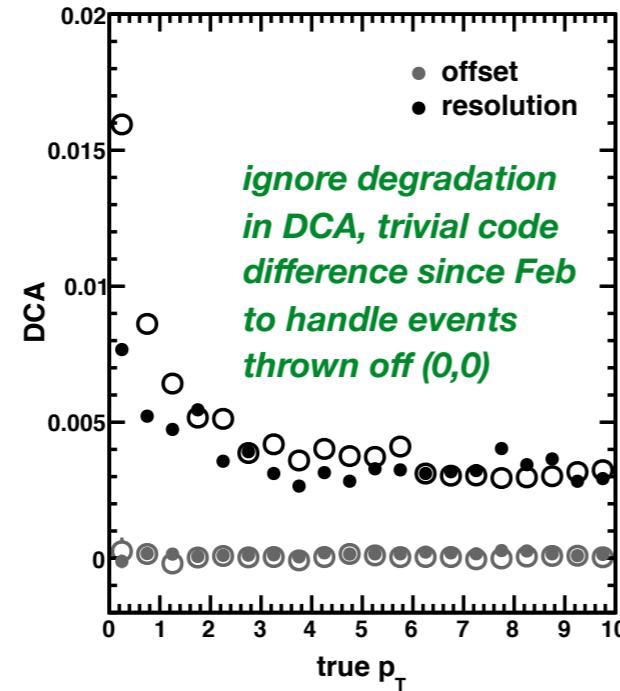
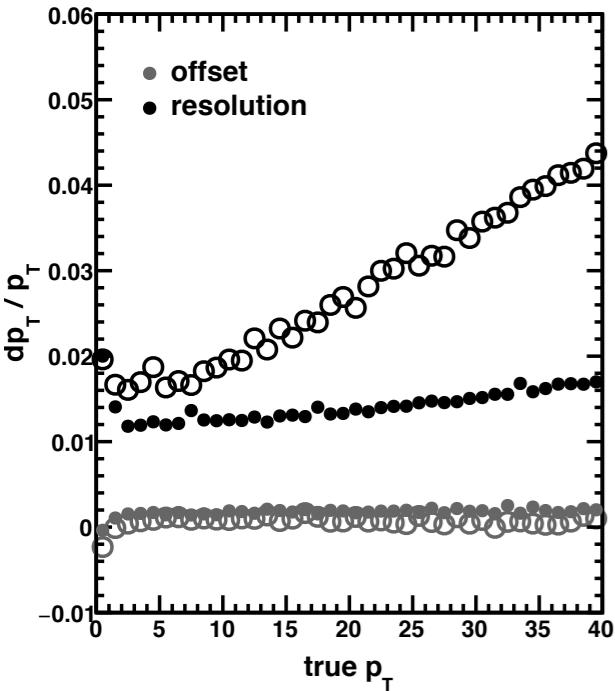
# 3+2+2 Layer MAPS Tracker

**closed symbols 4/27/16 status,  $r = 2.3, 3.2, 3.9, 19.6, 24.5, 34.4, 65.0$  cm**  
**open symbols, MIE reference design**



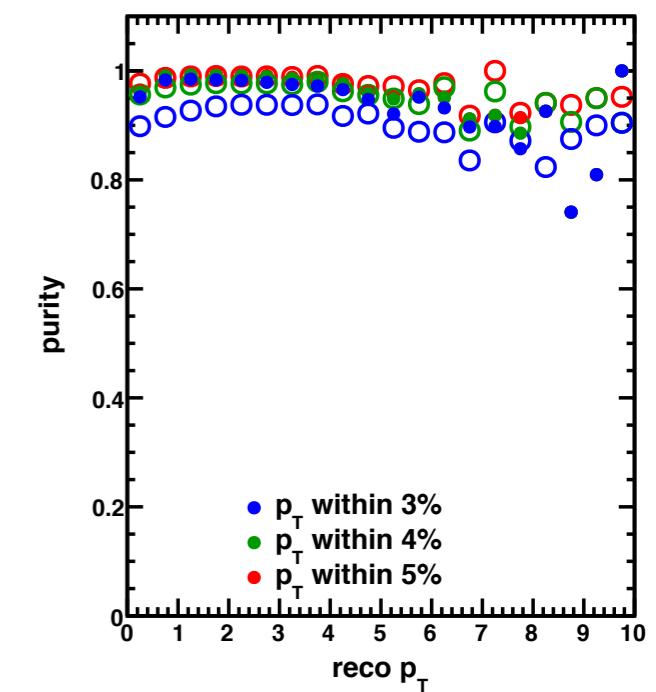
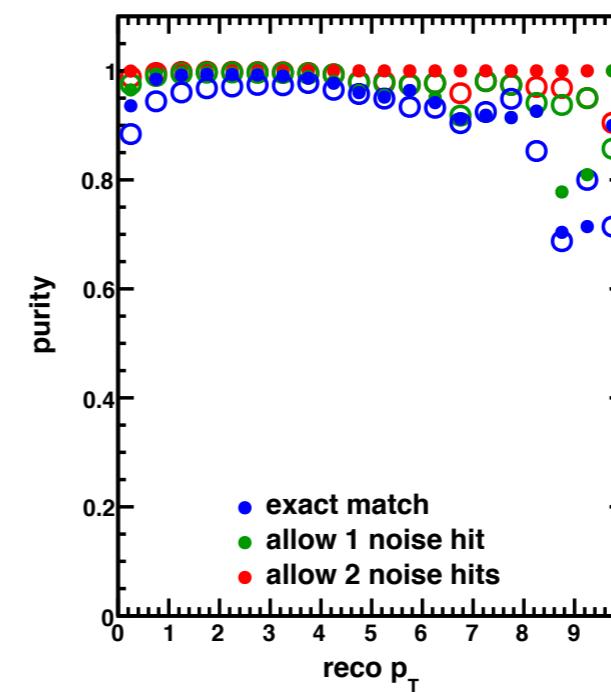
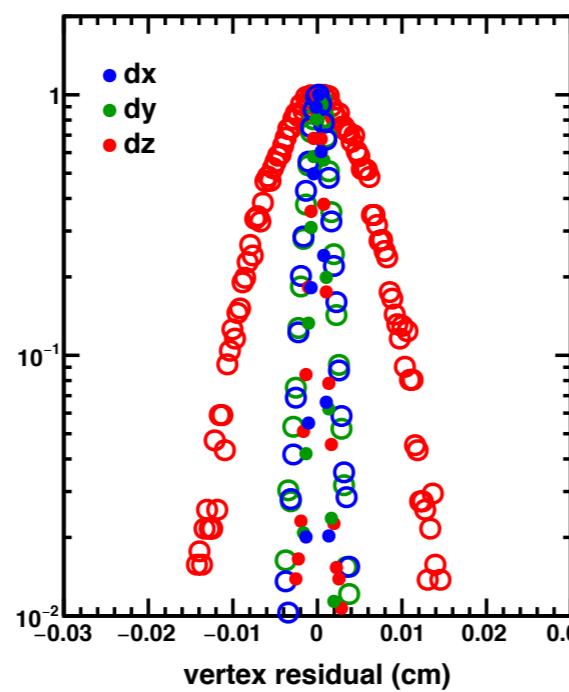
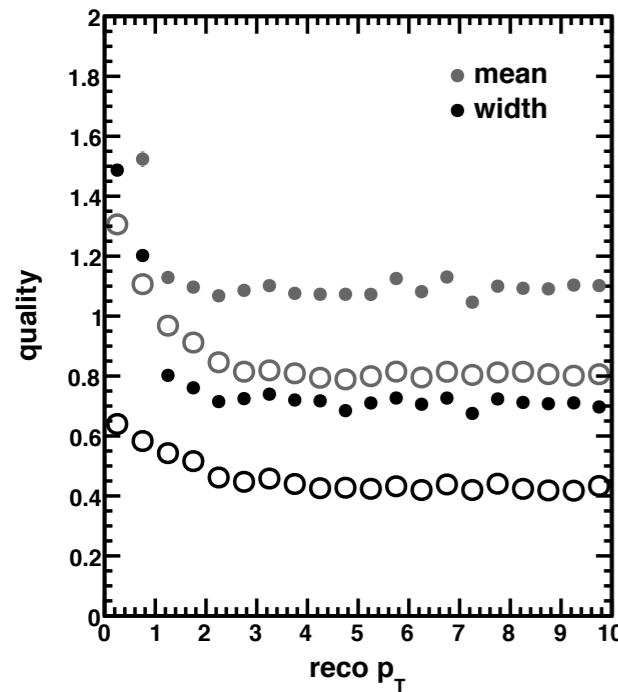
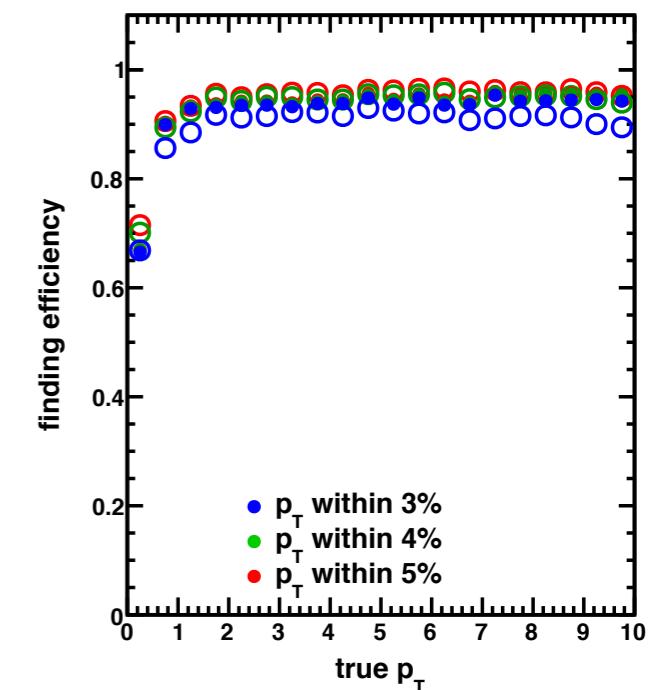
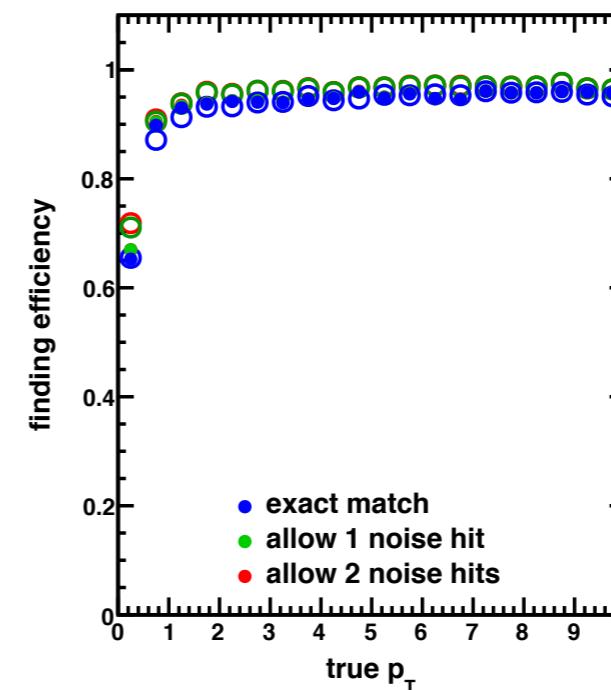
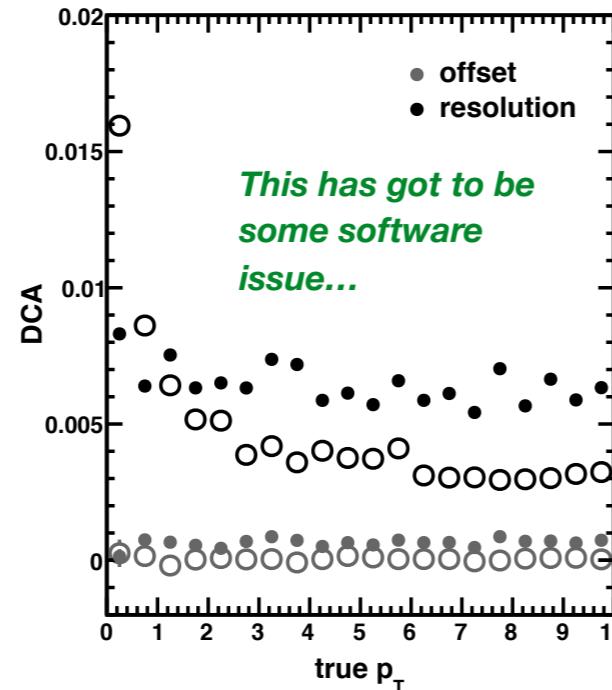
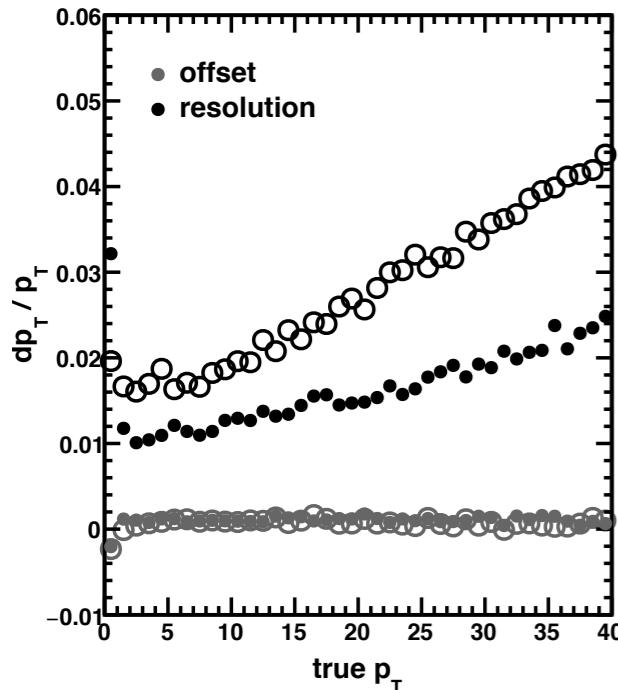
# 3+1+2 Layer MAPS Tracker

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**open symbols, MIE reference design**



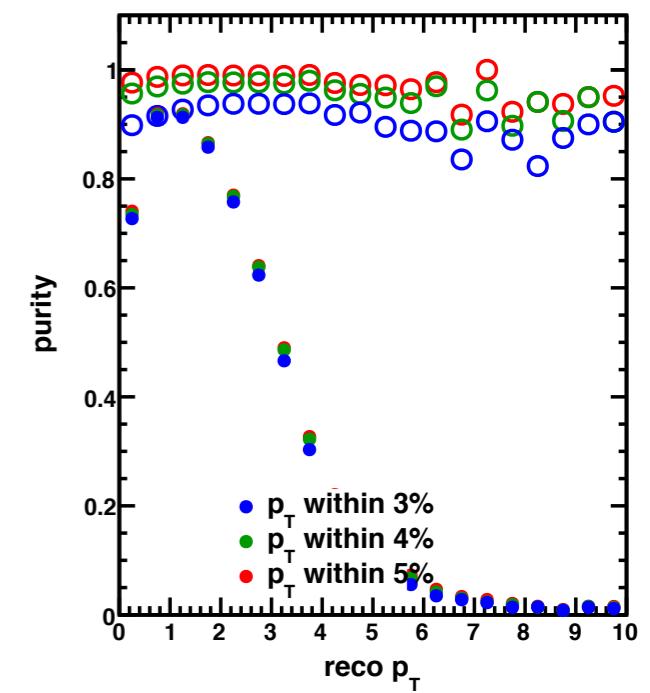
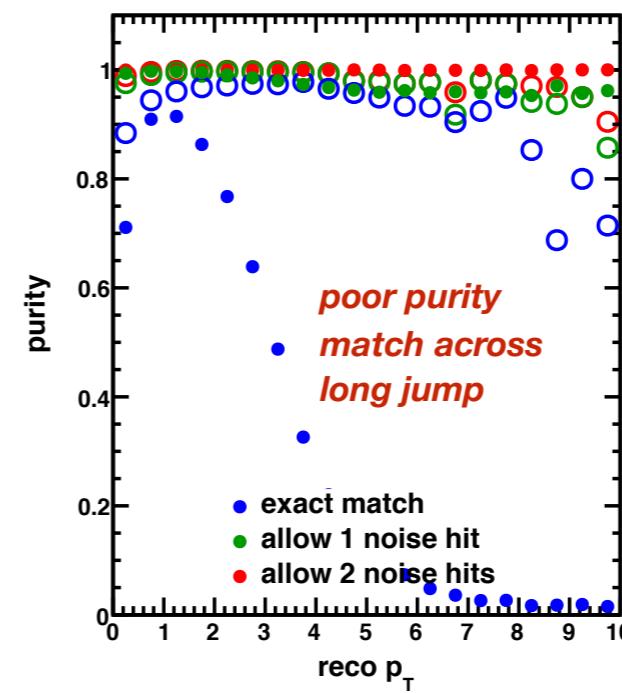
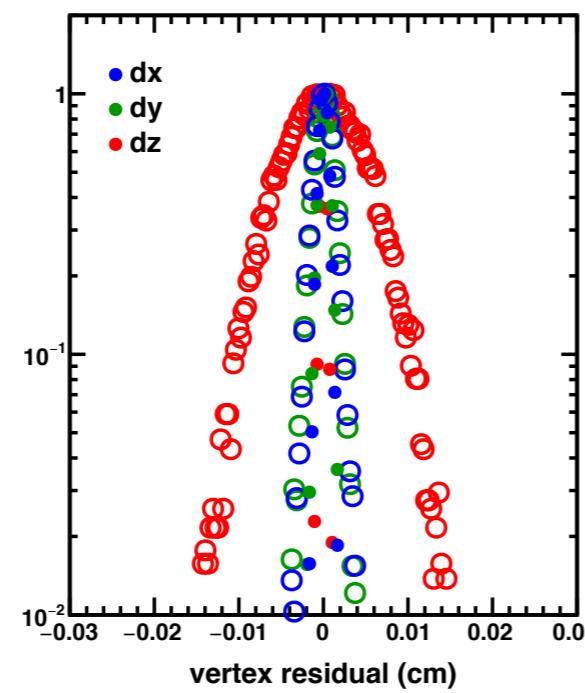
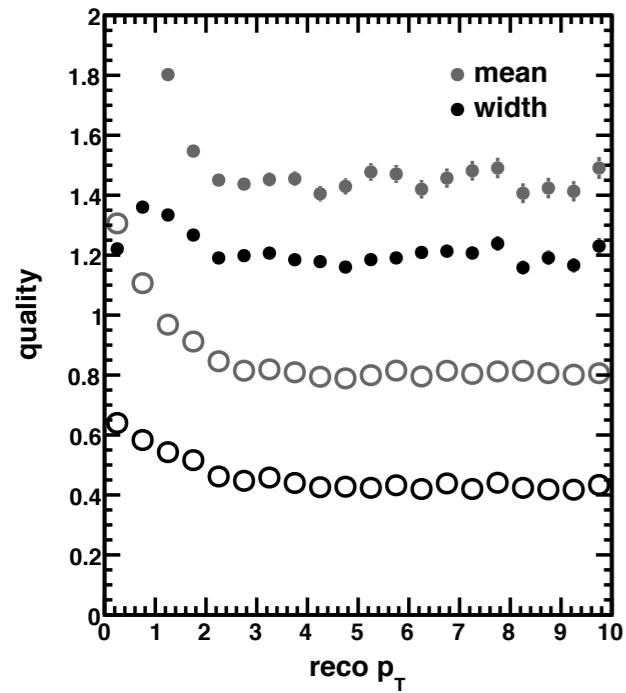
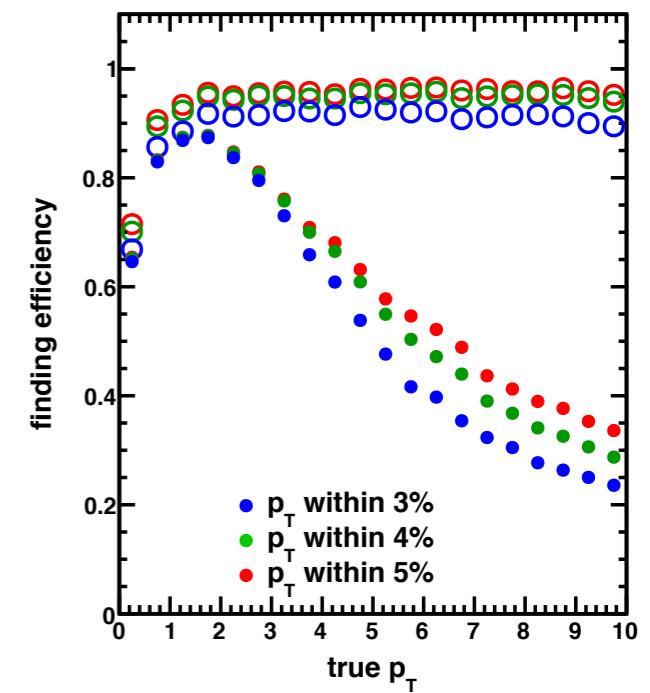
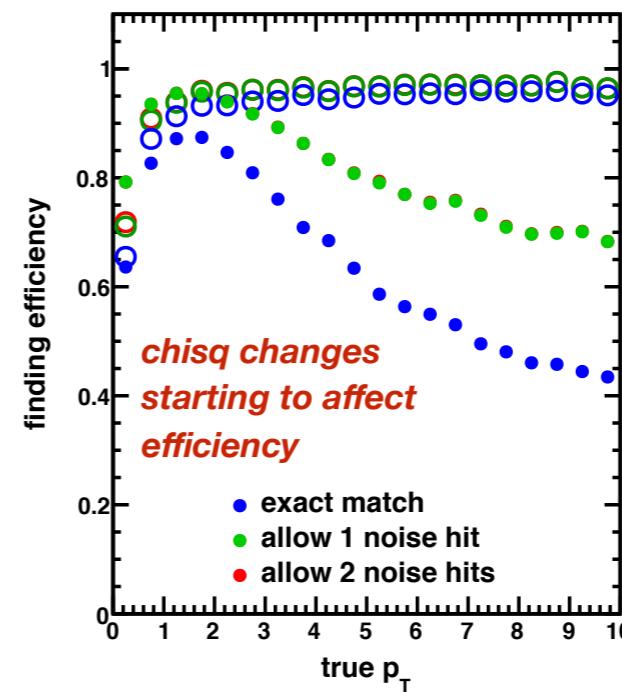
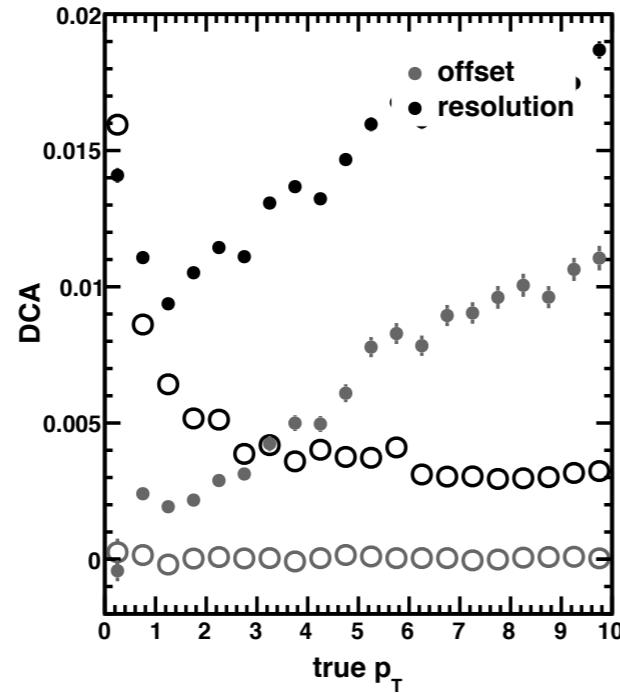
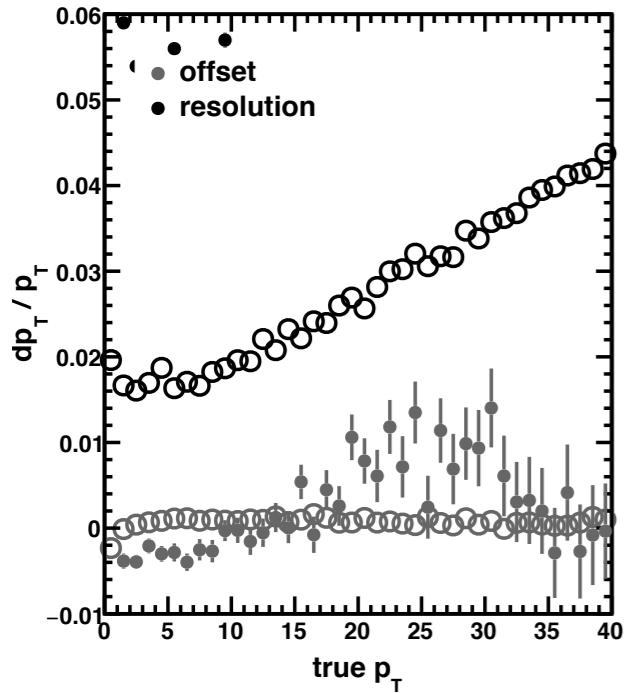
# 3+1+1 Layer MAPS Tracker

**closed symbols 04/28/16 status,  $r = 2.3, 3.2, 3.9, 19.6, 24.5, 34.4, 65.0$  cm**  
**open symbols, MIE reference design**



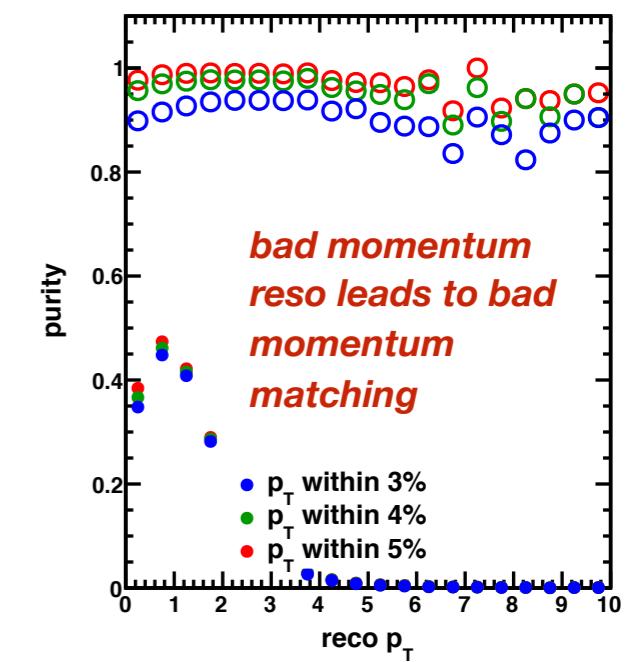
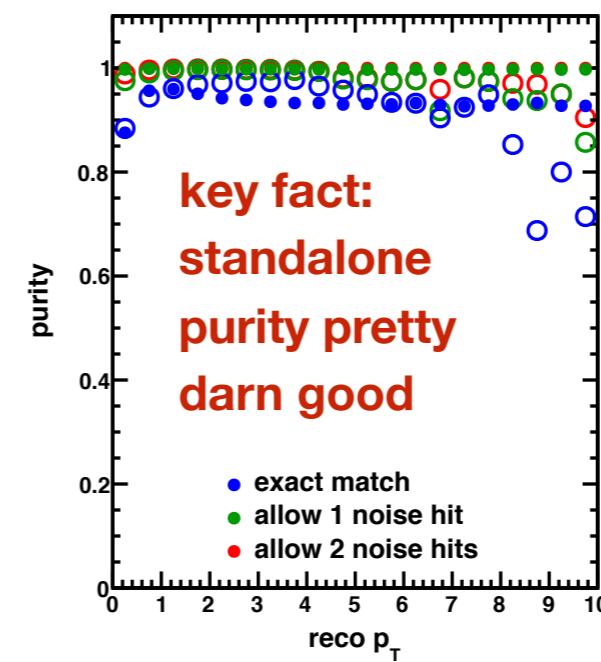
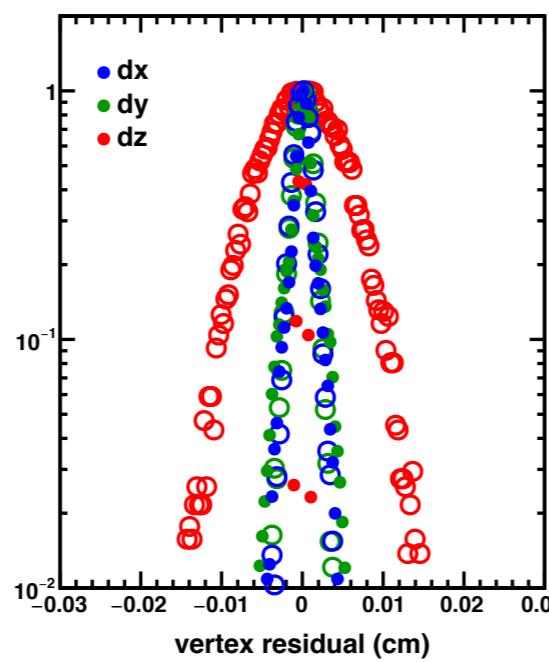
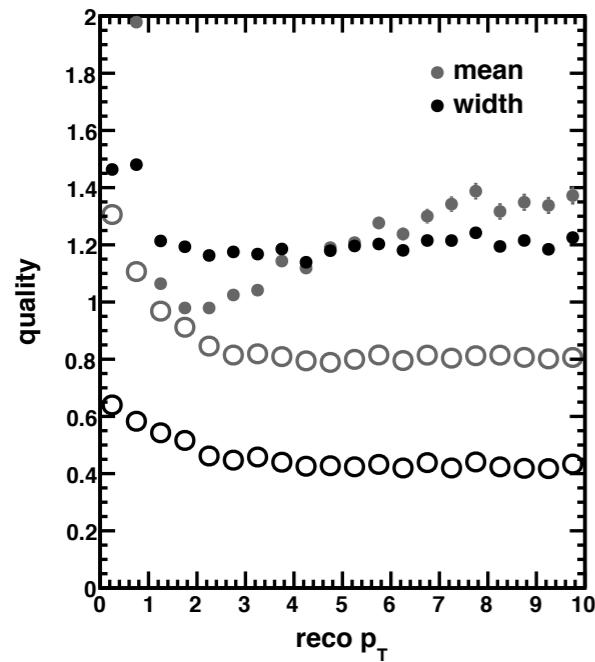
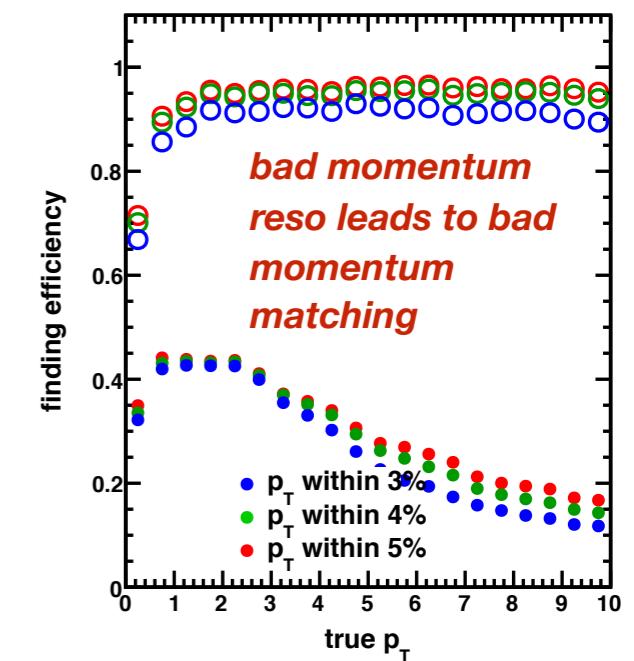
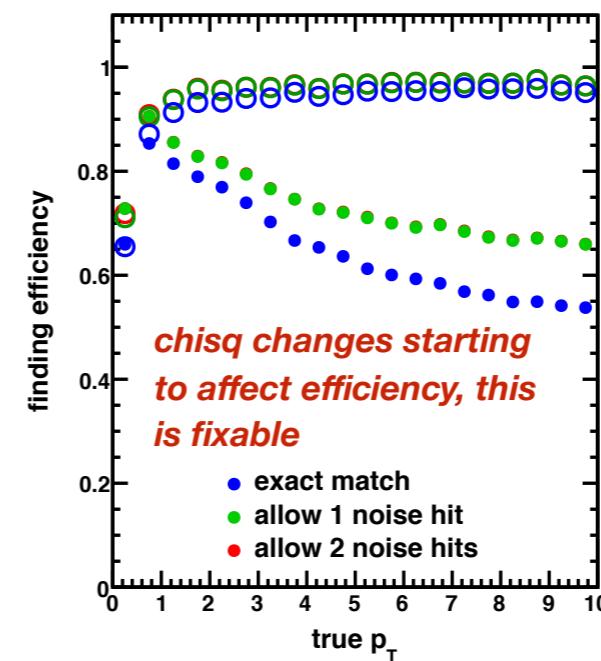
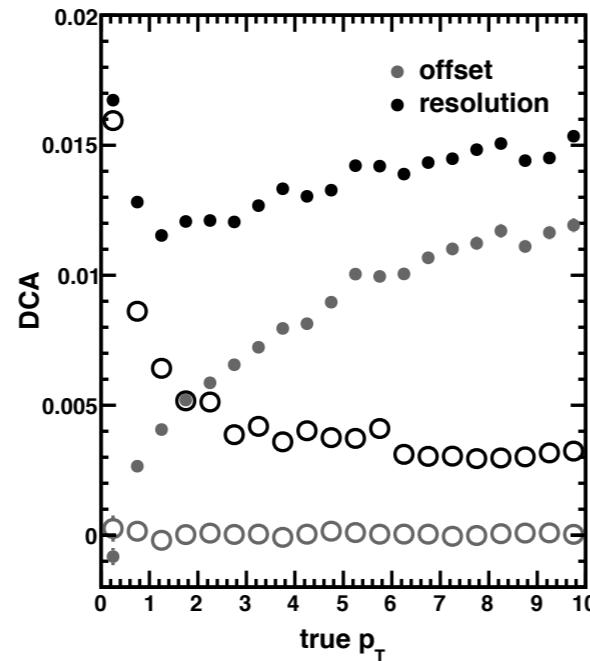
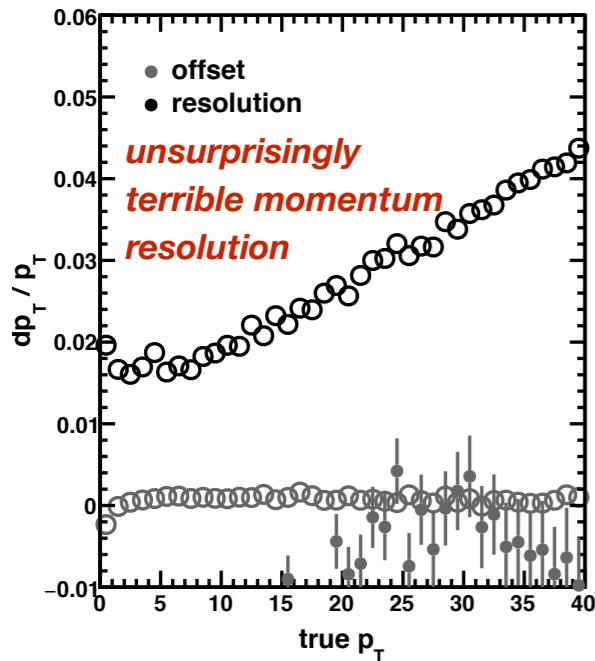
# 3+0+1 Layer MAPS Tracker

**closed symbols 04/19/16 status,  $r = 2.3, 3.2, 3.9, 19.6, 24.5, 34.4, 65.0 \text{ cm}$**   
**open symbols, MIE reference design**



# 3+0+0 Layer MAPS Tracker

**closed symbols 04/20/16 status,  $r = 2.3, 3.2, 3.9, 19.6, 24.5, 34.4, 65.0 \text{ cm}$**   
**open symbols, MIE reference design**

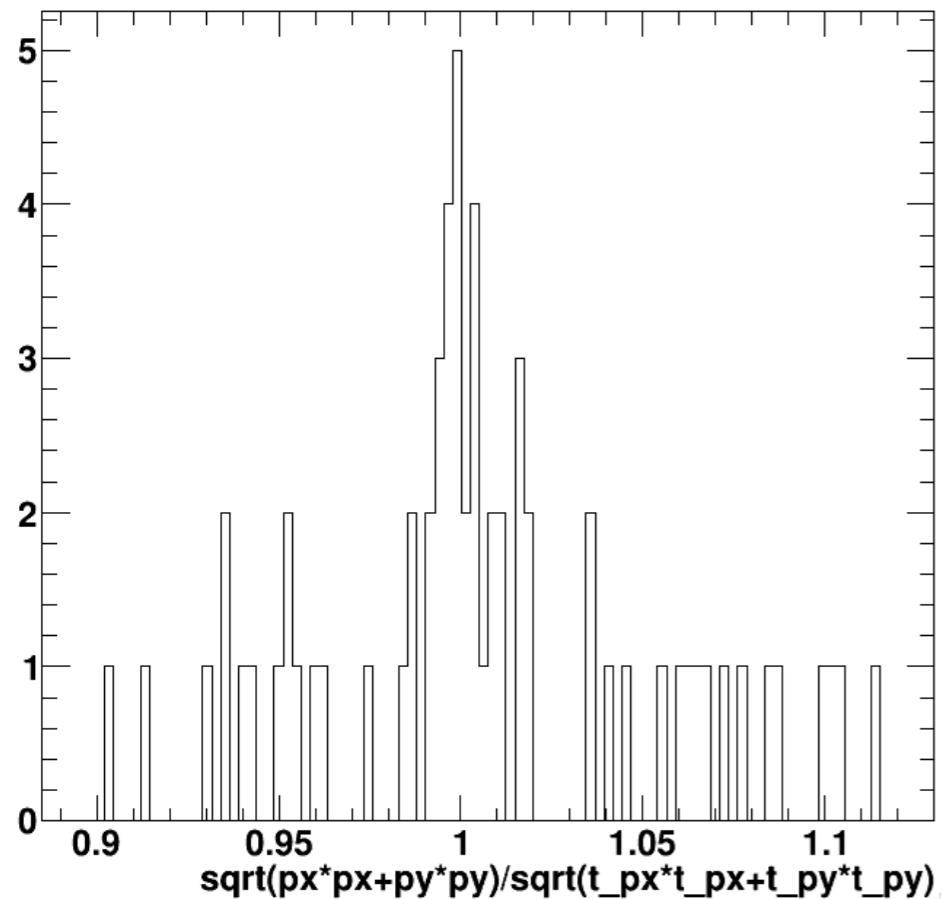


*swimming with the wrong momentum worsening vertex reso, might be fixable with assuming fixed average momentum*

# 3+0+0+TPC Tracker

**closed symbols 04/28/16 status,  $r = 2.3, 3.2, 3.9, 19.6, 24.5, 34.4, 65.0 \text{ cm}$**

my evaluator is crashing because the output format isn't up to spec (not all vertex fields are self-consistent)  
but with Alan's Momentum Evaluation I do see some tracks from 10-muon events matching to truth records

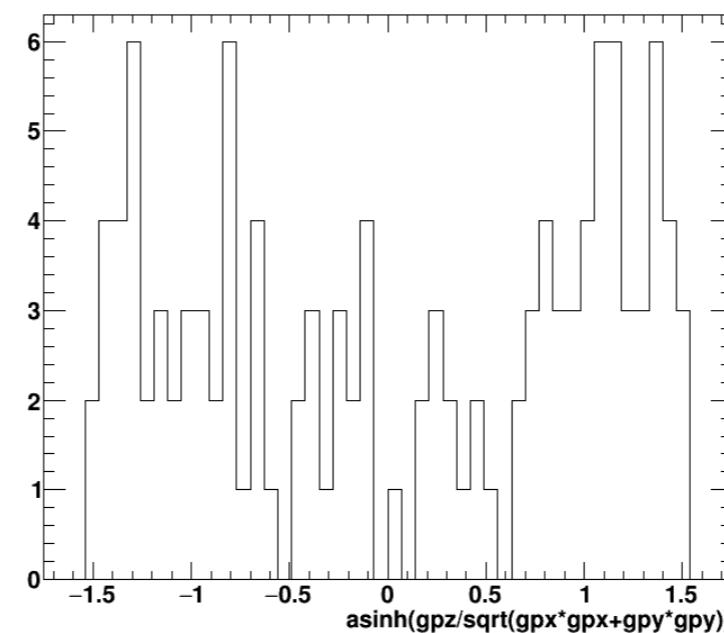


Further investigation shows some potential TPC issues:

CPU ~2 min / event on my laptop (very fast for silicon only)

Track efficiency appears lower than I expected, could be ~50%  
many missed truth particles leaving >59 hits

Maybe losing things  
preferentially at large eta



Purity of found tracks  
looks good:

